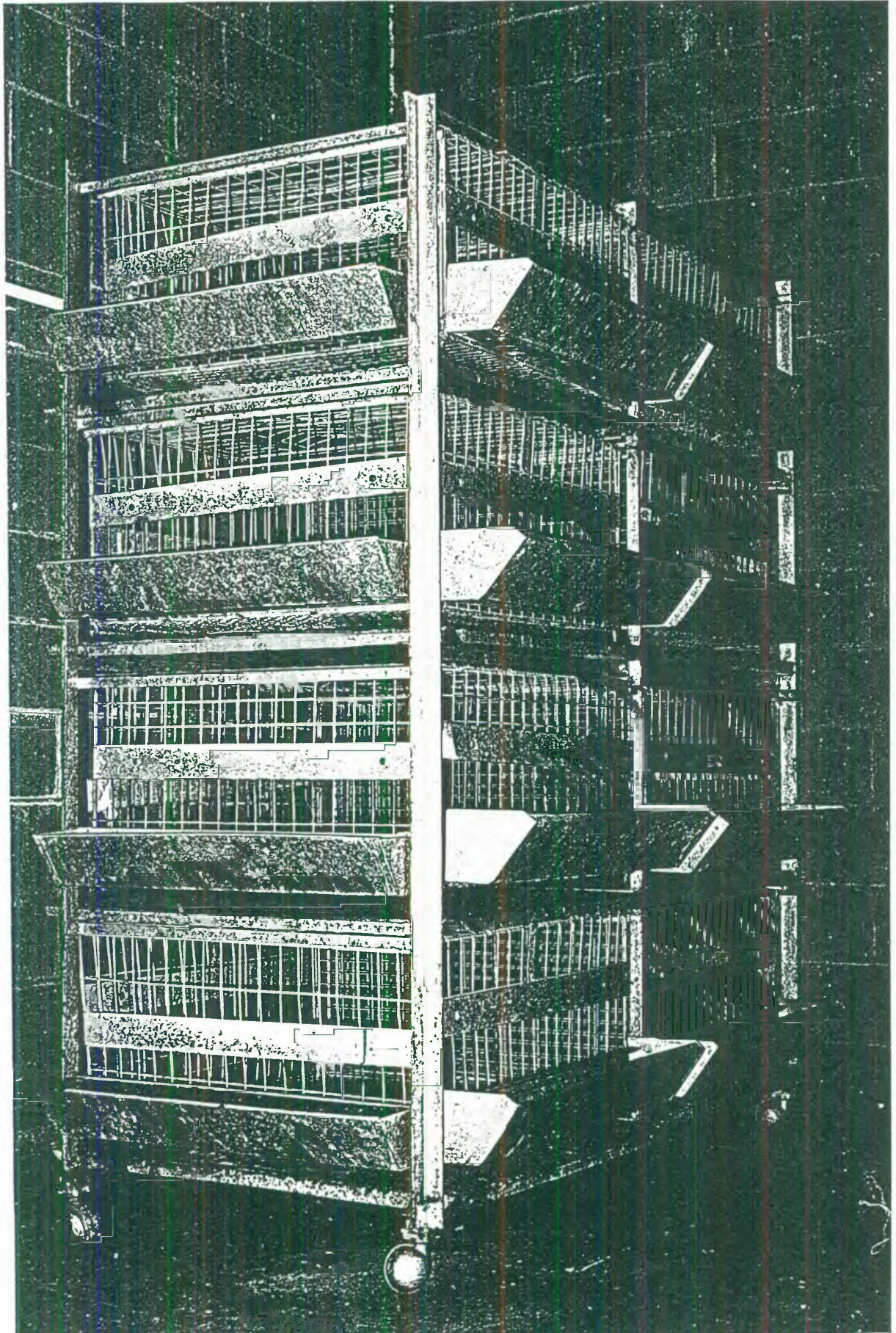


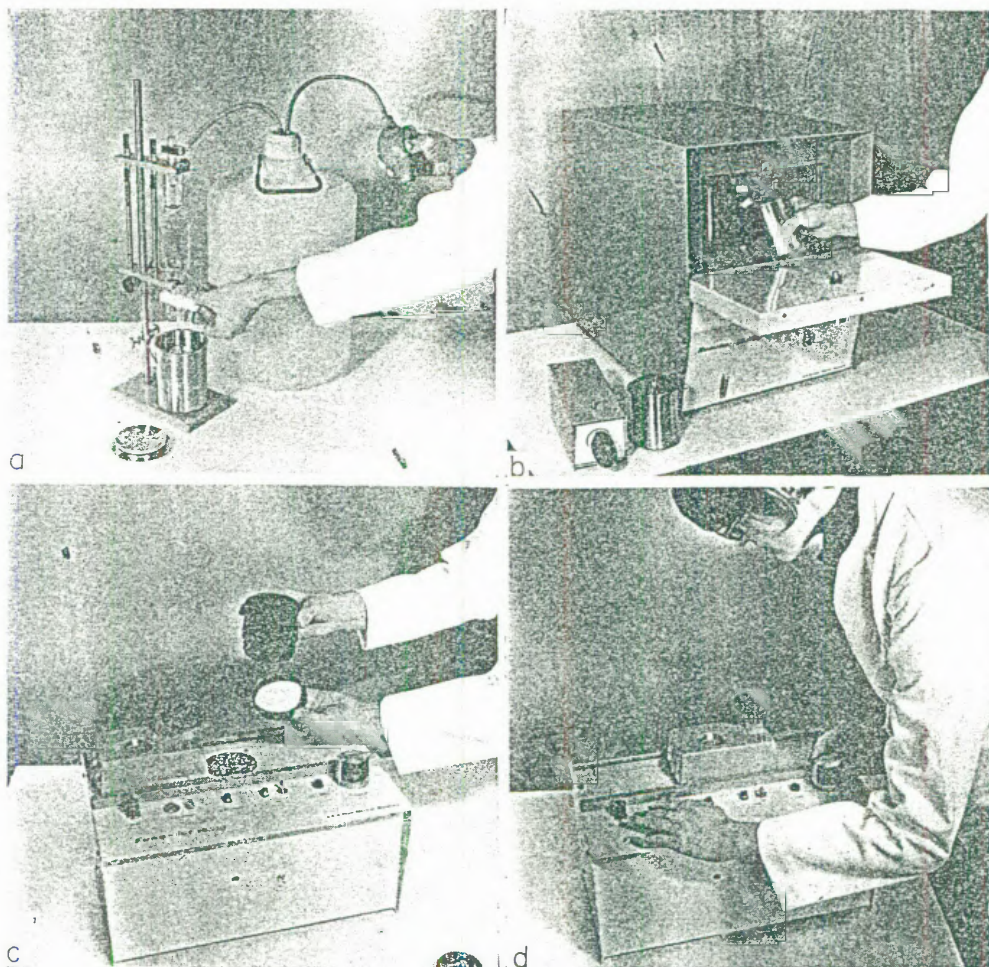
APPENDICES

Flashed cage unit for growth trials



Appendix B

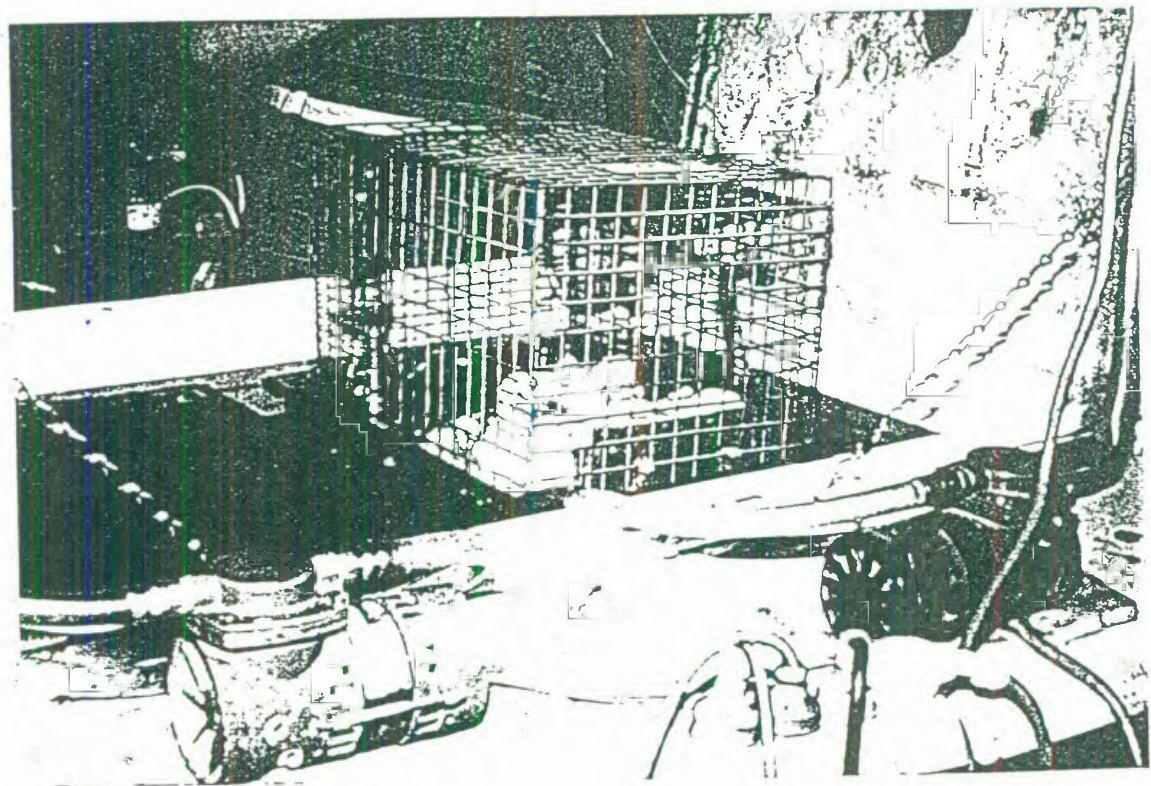
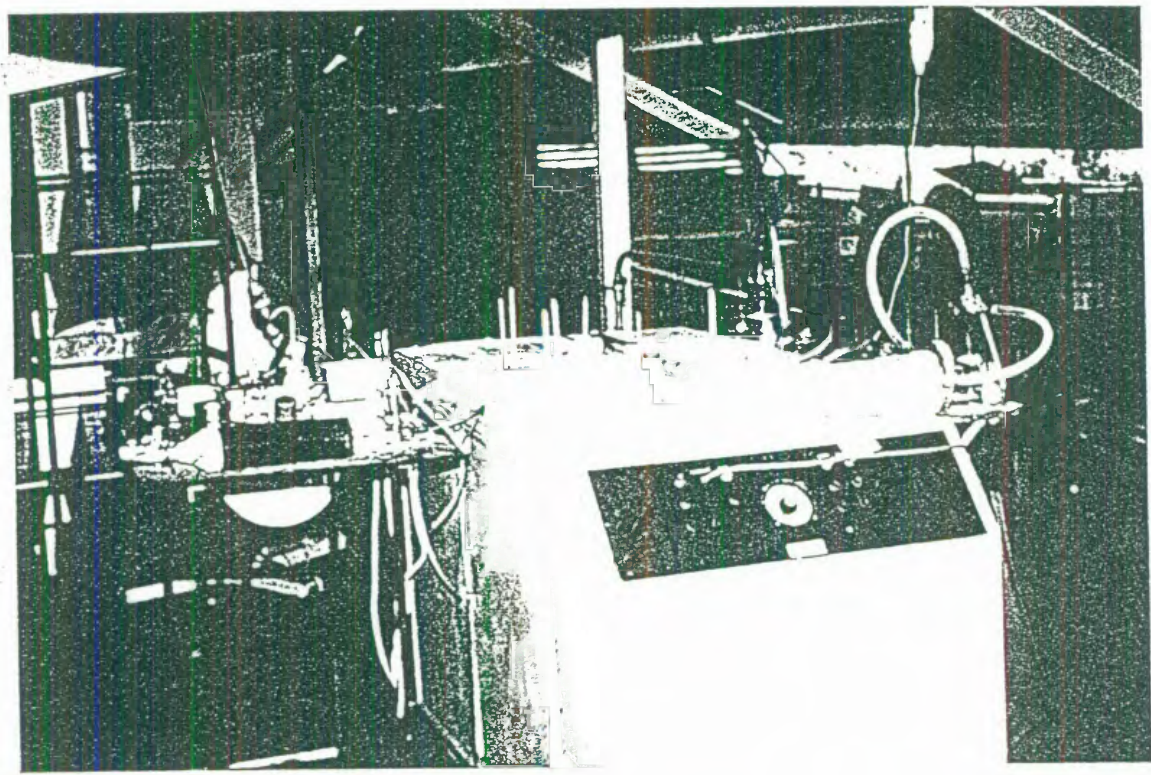
Foss-Let analyser for carcass fat analysis



(a) The tetrachloroethylene dispenser. (b) The reactor. (c) Foss-Let instrument with the filtering device. (d) Operation of the instrument.

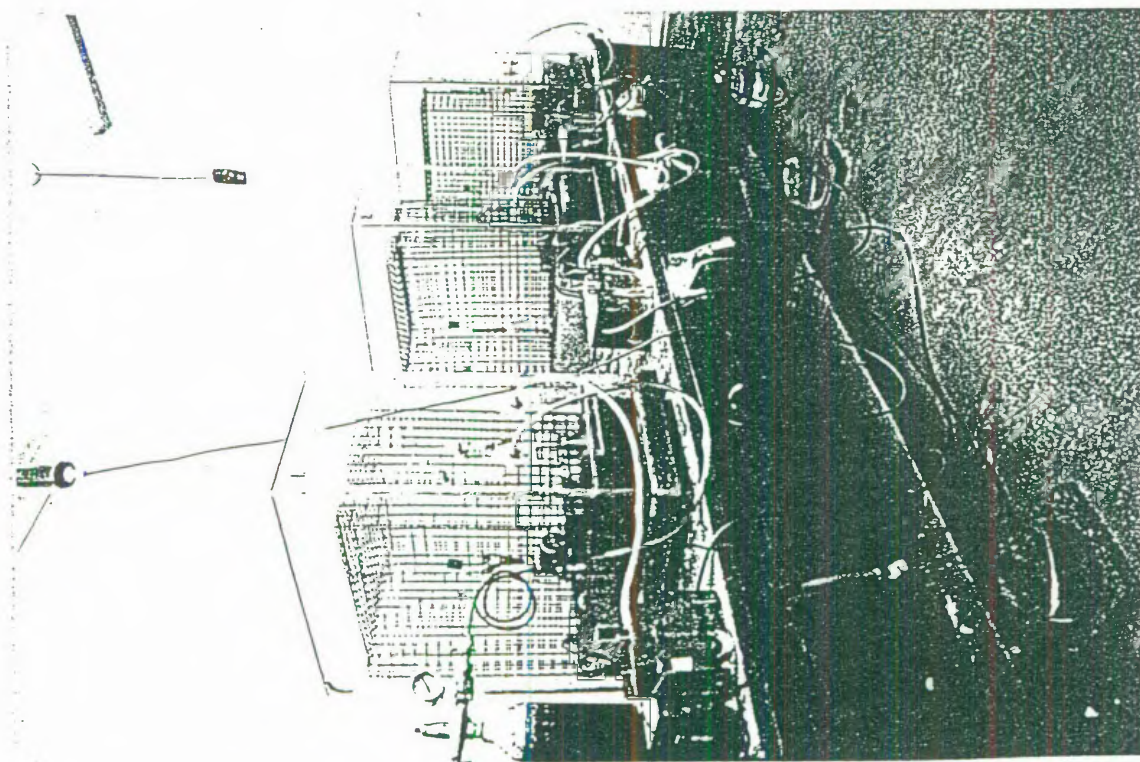
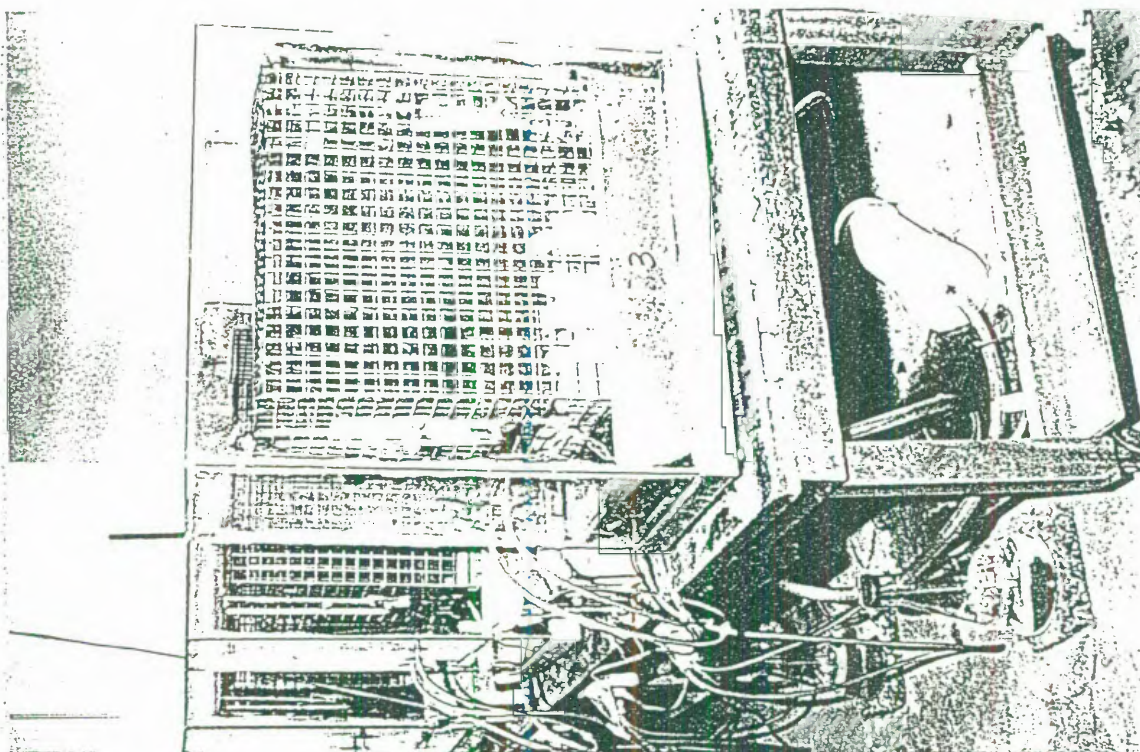
Appendix C

Flowchart respiration chambers used in subsequent Experiments 1 and 2



Appendix D

Closed-circuit respiration chambers used in calorimetry
Experiments 3



Appendix E

Daily body weight (Body wt), feed intake (FI), R.Q. and heat production (HP) of fat and lean lines from 24 to 42 days of age in calorimetry Experiment 1

| Day | Body wt (g) | Fat line | | | Lean line | | | |
|-------------------|-------------|----------|-------|-----------|-------------|--------|-------|-----------|
| | | FI (g) | R.Q. | HP (kJ/d) | Body wt (g) | FI (g) | R.Q. | HP (kJ/d) |
| 1 | 1.290 | 155.8 | 1.080 | 1133 | 1.390 | 162.3 | 0.977 | 1351 |
| 2 | 1.372 | 180.0 | 1.069 | 1154 | 1.465 | 154.0 | 0.999 | 1366 |
| 3 | 1.463 | 189.0 | 1.101 | 1197 | * | * | * | * |
| 1 | 1.101 | 93.5 | 0.966 | 1063 | 1.005 | 118.4 | 0.958 | 1165 |
| 2 | 1.135 | 121.3 | 1.003 | 1153 | 1.067 | 146.5 | 1.014 | 1205 |
| 3 | 1.182 | 122.5 | 0.981 | 1133 | 1.139 | 139.4 | 1.002 | 1236 |
| 1 | 2.606 | 162.3 | 0.938 | 1748 | 2.589 | 194.1 | 0.978 | 1908 |
| 2 | 2.638 | 142.4 | 0.932 | 1709 | 2.649 | 178.6 | 0.946 | 1881 |
| 3 | 2.680 | 196.8 | 1.009 | 1820 | 2.728 | 214.2 | 0.987 | 1961 |
| 1 | 2.949 | 179.3 | 0.973 | 1931 | 2.716 | 169.9 | 0.910 | 1993 |
| 2 | 2.980 | 175.3 | 0.941 | 1905 | 2.751 | 184.8 | 0.944 | 1984 |
| 3 | 2.987 | 231.1 | 1.001 | 2032 | 2.832 | 204.7 | 0.965 | 2048 |
| 1 | 2.744 | 251.0 | 0.941 | 1956 | 2.537 | 186.3 | 0.967 | 1749 |
| 2 | 2.872 | 201.6 | 1.026 | 1726 | 2.626 | 185.0 | 0.973 | 1758 |
| 3 | 2.977 | 234.0 | 1.056 | 1819 | 2.730 | 208.4 | 1.015 | 1843 |
| 1 | 2.524 | 181.0 | 1.017 | 1483 | 2.720 | 209.0 | 1.012 | 1777 |
| 2 | 2.608 | 241.0 | 1.083 | 1662 | 2.995 | 163.7 | 0.950 | 1878 |
| 3 | 2.741 | 230.7 | 1.058 | 1699 | 3.025 | 184.0 | 0.969 | 1838 |
| 1 | 2.598 | 141.0 | 0.971 | 1442 | 2.740 | 155.0 | 0.951 | 1625 |
| 2 | 2.659 | 187.0 | 1.034 | 1544 | 2.811 | 188.0 | 1.003 | 1703 |
| 3 | 2.729 | 173.4 | 0.976 | 1561 | 2.916 | 209.5 | 0.950 | 1615 |
| Fat line: | | | | | | | | |
| Control | | | | | | | | |
| 1 | 2.697 | 153.2 | 0.949 | 1702 | 2.626 | 118.7 | 0.955 | 1662 |
| 2 | 2.767 | 193.7 | 1.014 | 1751 | 2.693 | 124.9 | 0.955 | 1618 |
| 3 | 2.874 | 212.1 | 1.010 | 1853 | 2.697 | 174.9 | 1.003 | 1791 |
| 1 | 2.849 | 159.6 | 0.945 | 1694 | 2.637 | 170.3 | 0.937 | 1832 |
| 2 | 2.912 | 203.1 | 1.006 | 1770 | 2.682 | 143.9 | 0.949 | 1780 |
| 3 | 3.023 | 235.4 | 1.048 | 1929 | 2.710 | 180.1 | 0.951 | 1793 |
| 1 | 1.981 | 167.5 | 0.998 | 1372 | 1.926 | 190.5 | 1.052 | 1395 |
| 2 | 2.043 | 154.8 | 1.010 | 1402 | 2.009 | 169.1 | 1.029 | 1401 |
| 3 | 2.072 | 117.5 | 0.964 | 1254 | 2.101 | 191.3 | 1.052 | 1438 |
| 1 | 1.748 | 135.2 | 1.021 | 1156 | 2.208 | 184.5 | 1.060 | 1420 |
| 2 | 1.819 | 150.4 | 1.021 | 1244 | 2.294 | 202.6 | 1.075 | 1537 |
| 3 | 1.889 | 163.0 | 1.039 | 1318 | 2.390 | 219.4 | 1.078 | 1578 |
| 1 | 2.268 | 205.9 | 1.049 | 1588 | 2.169 | 200.0 | 1.022 | 1609 |
| 2 | 2.356 | 204.0 | 1.046 | 1583 | 2.295 | 196.9 | 1.016 | 1608 |
| 3 | 2.455 | 192.2 | 1.041 | 1578 | 2.373 | 176.2 | 0.996 | 1488 |
| 1 | 2.410 | 187.2 | 1.035 | 1575 | 2.336 | 184.0 | 1.027 | 1492 |
| 2 | 2.510 | 260.1 | 1.084 | 1726 | 2.473 | 228.6 | 1.040 | 1538 |
| 3 | 2.613 | 200.5 | 1.029 | 1713 | 2.567 | 200.7 | 1.050 | 1564 |
| Cimaterol-treated | | | | | | | | |

| Lean line: | Control | | | | Cimaterol-treated | | | |
|------------|---------|-------|-------|------|-------------------|-------|-------|------|
| 1 | 1.443 | 151.7 | 1.006 | 1378 | 1.337 | 126.2 | C.954 | 1321 |
| 2 | 1.513 | 158.5 | 0.995 | 1472 | 1.424 | 132.2 | C.941 | 1382 |
| 3 | 1.580 | 131.9 | 0.969 | 1471 | 1.506 | 152.7 | C.978 | 1395 |
| 1 | 2.376 | 160.5 | 0.963 | 1713 | 2.307 | 155.5 | C.949 | 1690 |
| 2 | 2.443 | 193.0 | 0.997 | 1770 | 2.378 | 161.5 | C.960 | 1665 |
| 3 | 2.521 | 194.8 | 0.987 | 1821 | 2.440 | 182.3 | C.990 | 1709 |
| 1 | 2.731 | 164.0 | 0.949 | 1749 | 2.835 | 136.3 | C.918 | 1843 |
| 2 | 2.807 | 190.0 | 0.995 | 1812 | 2.871 | 192.3 | C.945 | 1935 |
| 3 | 2.903 | 209.8 | 1.022 | 1976 | 2.983 | 228.8 | 1.001 | 2014 |
| 1 | 2.218 | 155.2 | 0.958 | 1462 | 2.406 | 155.8 | C.982 | 1586 |
| 2 | 2.294 | 193.6 | 1.038 | 1614 | 2.474 | 179.1 | 1.011 | 1610 |
| 3 | 2.361 | 191.0 | 1.024 | 1632 | 2.550 | 190.4 | 1.006 | 1666 |
| 1 | 2.587 | 107.4 | 0.914 | 1497 | 2.893 | 106.7 | C.882 | 1619 |
| 2 | 2.593 | 130.0 | 0.917 | 1576 | 2.834 | 127.5 | C.911 | 1623 |
| 3 | 2.617 | 129.0 | 0.939 | 1574 | 2.751 | 107.0 | C.925 | 1545 |
| 1 | 2.760 | 159.8 | 0.931 | 1835 | 2.356 | 145.0 | C.935 | 1639 |
| 2 | 2.870 | 196.3 | 0.993 | 1879 | 2.476 | 173.4 | C.963 | 1593 |
| 3 | 3.029 | 224.0 | 0.992 | 1990 | 2.558 | 213.2 | 1.002 | 1734 |
| 1 | 2.952 | 232.0 | 1.004 | 1989 | 2.863 | 141.3 | C.925 | 1676 |
| 2 | 3.047 | 214.6 | 1.001 | 2064 | 2.875 | 140.9 | C.931 | 1654 |
| 3 | 3.111 | 239.0 | 1.001 | 2119 | 3.000 | 155.9 | C.956 | 1657 |

Appendix F

Daily body weight, feed intake, R.Q. and heat production of fat and lean lines from 28 to 42 days of age in calorimetry Experiment 2

| Day | Body weight (kg) | | Feed intake (g) | | R.Q. | | Heat production (kJ/d) | |
|-----|---------------------|-------|--------------------|-------|-------|-------|---------------------------|------|
| | Fat | Lean | Fat | Lean | Fat | Lean | Fat | Lean |
| 1 | 1.616 | 1.466 | 157.0 | 141.0 | 1.042 | 0.976 | 1267 | 1230 |
| 2 | 1.700 | 1.522 | 169.0 | 163.0 | 1.028 | 0.973 | 1334 | 1390 |
| 3 | 1.784 | 1.638 | 153.5 | 174.7 | 1.033 | 1.021 | 1346 | 1454 |
| 4 | 1.868 | 1.724 | 198.0 | 178.0 | 0.964 | 1.006 | 1559 | 1544 |
| 5 | 1.952 | 1.810 | 185.0 | 170.0 | 1.015 | 1.007 | 1449 | 1485 |
| 1 | 2.451 | 2.183 | 198.6 | 191.3 | 1.012 | 0.936 | 1677 | 1783 |
| 2 | 2.542 | 2.250 | 204.5 | 183.7 | 1.022 | 0.990 | 1690 | 1778 |
| 3 | 2.633 | 2.317 | 230.7 | 160.2 | 1.025 | 0.968 | 1771 | 1722 |
| 4 | 2.724 | 2.383 | 215.7 | 177.5 | 0.995 | 0.995 | 1756 | 1738 |
| 5 | 2.815 | 2.450 | 215.7 | 183.4 | 1.012 | 1.009 | 1784 | 1765 |
| 1 | 1.519 | 1.408 | 140.7 | 136.7 | 0.982 | 0.996 | 1272 | 1250 |
| 2 | 1.584 | 1.486 | 158.4 | 156.3 | 1.008 | 0.987 | 1304 | 1317 |
| 3 | 1.680 | 1.565 | 166.5 | 162.7 | 1.019 | 1.013 | 1360 | 1337 |
| 4 | 1.716 | 1.643 | 175.4 | 173.3 | 1.005 | 1.011 | 1422 | 1370 |
| 5 | 1.731 | 1.721 | 162.8 | 173.7 | 0.941 | 0.990 | 1415 | 1410 |
| 1 | 2.122 | 2.297 | 166.0 | 186.8 | 0.980 | 1.001 | 1475 | 1549 |
| 2 | 2.132 | 2.382 | 183.0 | 179.5 | 1.006 | 0.978 | 1506 | 1569 |
| 3 | 2.242 | 2.466 | 189.0 | 186.0 | 0.998 | 1.005 | 1570 | 1589 |
| 4 | 2.302 | 2.551 | 186.5 | 219.4 | 1.073 | 1.023 | 1462 | 1693 |
| 1 | 1.538 | 1.592 | 113.0 | 141.0 | 0.985 | 1.007 | 1331 | 1343 |
| 2 | 1.659 | 1.663 | 158.0 | 159.0 | 0.992 | 1.000 | 1401 | 1351 |
| 3 | 1.730 | 1.734 | 167.4 | 166.0 | 0.996 | 0.998 | 1433 | 1362 |
| 4 | 1.801 | 1.805 | 183.0 | 190.0 | 1.016 | 1.008 | 1468 | 1398 |
| 5 | 1.872 | 1.876 | 186.0 | 195.0 | 1.015 | 1.035 | 1471 | 1448 |
| 1 | 1.859 | 2.076 | 168.0 | 191.5 | 0.978 | 0.967 | 1435 | 1701 |
| 2 | 1.959 | 2.151 | 185.0 | 195.0 | 1.031 | 1.000 | 1526 | 1729 |
| 3 | 2.050 | 2.226 | 193.0 | 191.0 | 1.021 | 0.984 | 1600 | 1738 |
| 4 | 2.140 | 2.301 | 205.3 | 209.0 | 1.031 | 0.995 | 1608 | 1779 |
| 5 | 2.230 | 2.376 | 208.0 | 212.0 | 1.010 | 0.980 | 1618 | 1753 |
| 1 | 1.645 | 1.652 | 140.0 | 153.8 | 0.980 | 0.977 | 1304 | 1466 |
| 2 | 1.720 | 1.729 | 170.0 | 174.4 | 0.991 | 0.995 | 1373 | 1512 |
| 3 | 1.794 | 1.806 | 178.0 | 188.0 | 0.986 | 0.981 | 1396 | 1590 |
| 4 | 1.868 | 1.882 | 177.0 | 190.0 | 0.984 | 1.002 | 1440 | 1578 |
| 5 | 1.943 | 1.959 | 202.0 | 198.0 | 1.041 | 1.026 | 1527 | 1620 |
| 1 | 2.214 | 2.064 | 180.0 | 180.2 | 1.008 | 0.985 | 1543 | 1622 |
| 2 | 2.297 | 2.153 | 183.0 | 187.4 | 1.002 | 0.990 | 1593 | 1637 |
| 3 | 2.380 | 2.242 | 196.5 | 196.8 | 1.024 | 1.009 | 1603 | 1666 |
| 4 | 2.462 | 2.330 | 201.0 | 204.0 | 0.963 | 0.996 | 1700 | 1718 |
| 5 | 2.545 | 2.419 | 212.8 | 214.0 | 1.018 | 1.004 | 1691 | 1706 |

Appendix G

Daily body weight, feed intake, heat production and F.Q of Steggles female broilers aged 21 to 35 days in calorimetry Experiment 3

| Day | Rep. | Body weight (kg) | | | | R.Q. | | | |
|-----|------|------------------|-------|-------|-------|-------|-------|-------|-------|
| | | CON | THEO | CAS | CIM | CON | THEO | CAS | CIM |
| 1 | 1 | 1.534 | 1.605 | 1.546 | 1.623 | 0.886 | 0.947 | 0.896 | 0.931 |
| | 2 | 2.258 | 2.248 | 2.193 | 1.621 | 0.933 | 0.932 | 0.933 | 0.979 |
| | 3 | 1.612 | 1.832 | 1.743 | 1.780 | 0.985 | 0.976 | 0.938 | 0.951 |
| | 4 | 2.320 | 2.643 | 2.306 | 2.321 | 0.957 | 0.953 | 0.971 | 0.977 |
| 2 | 1 | 1.577 | 1.638 | 1.598 | 1.672 | 0.845 | 0.892 | 0.878 | 0.914 |
| | 2 | 2.297 | 2.289 | 2.252 | 1.688 | 0.936 | 0.941 | 0.918 | 0.952 |
| | 3 | 1.687 | 1.891 | 1.817 | 1.853 | 0.977 | 0.954 | 0.930 | 0.947 |
| | 4 | 2.357 | 2.672 | 2.359 | 2.367 | 0.895 | 0.947 | 0.962 | 0.948 |
| 3 | 1 | 1.620 | 1.670 | 1.649 | 1.722 | 0.951 | 0.985 | 0.928 | 0.989 |
| | 2 | 2.336 | 2.330 | 2.311 | 1.756 | 0.916 | 0.950 | 0.935 | 0.984 |
| | 3 | 1.762 | 1.950 | 1.891 | 1.926 | 0.982 | 0.969 | 0.951 | 0.960 |
| | 4 | 2.394 | 2.701 | 2.412 | 2.413 | 0.947 | 0.938 | 0.971 | 0.954 |
| 4 | 1 | 1.663 | 1.702 | 1.701 | 1.771 | 0.965 | 0.927 | 0.936 | 0.952 |
| | 2 | 2.376 | 2.371 | 2.370 | 1.823 | 0.934 | 0.962 | 0.931 | 0.954 |
| | 3 | 1.838 | 2.009 | 1.965 | 1.999 | 1.018 | 0.949 | 0.895 | 0.965 |
| | 4 | 2.431 | 2.730 | 2.464 | 2.458 | 0.943 | 0.936 | 0.945 | 0.929 |
| 5 | 1 | 1.706 | 1.734 | 1.753 | 1.821 | 0.985 | 0.987 | 0.948 | 0.976 |
| | 2 | 2.415 | 2.412 | 2.429 | 1.891 | 1.136 | 0.966 | 0.944 | 0.975 |
| | 3 | 1.913 | 2.068 | 2.039 | 2.072 | 1.019 | 0.952 | 0.931 | 0.955 |
| | 4 | 2.468 | 2.760 | 2.517 | 2.504 | 0.969 | 0.935 | 0.953 | 0.957 |
| 6 | 1 | 1.750 | 1.767 | 1.804 | 1.870 | 0.927 | 0.982 | 0.976 | 0.993 |
| | 2 | 2.454 | 2.452 | 2.489 | 1.958 | 0.975 | 0.960 | 0.939 | 0.966 |
| | 3 | 1.988 | 2.126 | 2.113 | 2.146 | 1.007 | 0.973 | 0.936 | 0.965 |
| | 4 | 2.504 | 2.789 | 2.570 | 2.550 | 0.959 | 0.961 | 0.969 | 0.956 |

| Feed intake (g) | | | | Heat production (kJ/d) | | | |
|-----------------|-------|-------|-------|------------------------|------|------|------|
| CON | THEO | CAS | CIM | CON | THEO | CAS | CIM |
| 107.8 | 109.3 | 109.0 | 108.0 | 1379 | 1258 | 1373 | 1230 |
| 155.8 | 156.2 | 154.5 | 156.1 | 1680 | 1681 | 1695 | 1351 |
| 157.8 | 158.6 | 158.1 | 157.9 | 1393 | 1563 | 1611 | 1551 |
| 178.9 | 184.2 | 188.0 | 187.3 | 1770 | 1871 | 1790 | 1794 |
| 68.2 | 104.1 | 102.3 | 104.5 | 1189 | 1240 | 1331 | 1232 |
| 167.0 | 167.8 | 165.8 | 167.8 | 1801 | 1706 | 1779 | 1412 |
| 169.3 | 168.6 | 168.3 | 168.7 | 1440 | 1548 | 1639 | 1562 |
| 173.9 | 180.7 | 178.1 | 178.3 | 1699 | 1860 | 1730 | 1776 |
| 140.9 | 149.1 | 148.4 | 148.6 | 1240 | 1247 | 1670 | 1242 |
| 168.2 | 168.4 | 166.3 | 167.9 | 1771 | 1708 | 1795 | 1395 |
| 179.6 | 179.1 | 179.5 | 176.2 | 1457 | 1588 | 1694 | 1600 |
| 187.2 | 186.2 | 188.6 | 188.4 | 1722 | 1839 | 1729 | 1783 |
| 144.7 | 147.0 | 148.7 | 149.9 | 1326 | 1245 | 1451 | 1385 |
| 163.8 | 167.1 | 166.8 | 168.4 | 1721 | 1608 | 1750 | 1483 |
| 189.2 | 184.7 | 189.5 | 188.9 | 1533 | 1531 | 1789 | 1661 |
| 173.3 | 173.0 | 174.2 | 174.0 | 1697 | 1703 | 1705 | 1755 |
| 167.0 | 152.6 | 168.5 | 169.4 | 1360 | 1302 | 1487 | 1394 |
| 177.9 | 170.3 | 176.6 | 180.9 | 1456 | 1613 | 1751 | 1481 |
| 188.8 | 181.8 | 190.0 | 188.1 | 1610 | 1617 | 1795 | 1680 |
| 153.7 | 151.5 | 154.9 | 154.7 | 1615 | 1631 | 1640 | 1660 |
| 186.8 | 174.5 | 188.4 | 189.0 | 1516 | 1373 | 1553 | 1477 |
| 176.7 | 168.3 | 175.7 | 180.2 | 1669 | 1598 | 1718 | 1525 |
| 183.1 | 184.8 | 190.0 | 189.3 | 1634 | 1714 | 1812 | 1725 |
| 169.3 | 164.4 | 170.2 | 168.8 | 1533 | 1700 | 1595 | 1616 |